

QUIVIRA

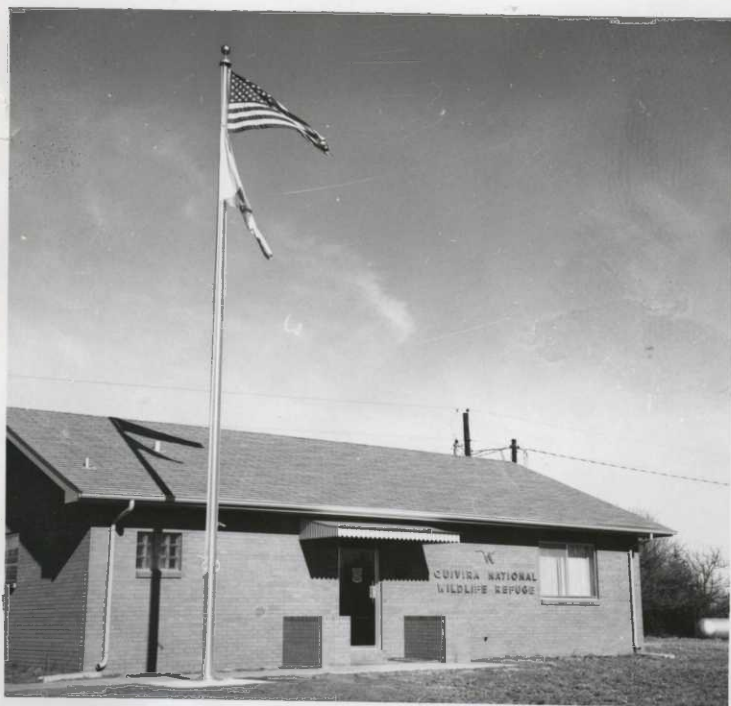
NARRATIVE REPORT

January-December 1966

QUIVIRA NATIONAL WILDLIFE REFUGE

NARRATIVE REPORT

JANUARY 1 to DECEMBER 31, 1966



QUIVIRA NATIONAL WILDLIFE REFUGE

STAFFORD, KANSAS

PERSONNEL

Refuge Manager - - - - - Joshua J. Harman
(Transferred to RO 4/15/66)

Refuge Manager - - - - - Charles R. Darling
(EOD 4/5/66)

Assistant Refuge Manager - - - - - Ronald S. Sullivan
(Transferred to Brown's Park 3/14/66)

Assistant Refuge Manager - - - - - Michael B. Brownlee
(EOD 3/29/66)

Refuge Clerk - - - - - Wayne E. Dale

Maintenanceman - - - - - Earl Miller

Maintenanceman - - - - - Darrell Keesling

Laborer, Farm (WAE) - - - - - Harvey Keesling
(Term. 4/9/66)

Laborer, Farm (WAE) - - - - - Ronald Calvird
(5/24 to 8/23/66)

Laborer, Farm (WAE) - - - - - Phillip McNaughton
(5/10/66 to Present)

Laborer, Farm (WAE) - - - - - Thomas Peintner
(6/14 to 9/2/66)

Laborer, Farm (WAE) - - - - - Clyneeth Shusky
(4/4 to 9/9/66)

Laborer, Farm (WAE) - - - - - Keith Starr
(5/31 to 9/9/66)

Laborer, Farm (WAE) - - - - - Louis Wilson
(6/28/66 to Present)

Student Aid (YOC) - - - - - Jacky Burleson
(6/20 to 8/20/66)

Student Aid (YOC) - - - - - Kenneth King
(6/20 to 8/20/66)

Student Aid (YOC) - - - - - Mike Stalcup
(8/1 to 8/26/66)

QUIVIRA NATIONAL WILDLIFE REFUGE
STAFFORD, KANSAS
NARRATIVE REPORT
JANUARY 1 to DECEMBER 31, 1966

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QUIVIRA NATIONAL WILDLIFE REFUGE

STAFFORD, KANSAS

NARRATIVE REPORT

JANUARY 1 to DECEMBER 31, 1966

I. GENERAL

A. Weather Conditions.

Month	Snow	Precip.	Headquarters		Max. Temp.	Min. Temp.
			Precip.	Ave. Precip.		
Jan.	6.2 "	.38"	.32"	.68"	56°	-10°
Feb.	3.4	2.19	.75	.91	58	- 4
March	T	.02	0	1.21	86	9
April		1.98	1.56	2.39	82	22
May		.94	.57	3.90	98	33
June		1.64	2.03	3.80	96	50
July		5.72	5.45	3.03	105	65
August		2.08	3.02	2.90	100	52
Sept.		.94	.95	1.81	91	45
Oct.		.19	.23	1.33	90	25
Nov.		T	0	.86	77	12
Dec.	11.75	1.24	1.39	.81	68	2
Totals	21.35"	17.32"	16.27"	23.63"	Extremes 105°	-10°

The official precipitation and temperature data were taken from the U. S. Weather Bureau station at Hudson, Kansas except "Headquarters Precipitation". Average precipitation figures are for the period 1931 - 1952. The year was the driest on record for most of South-central Kansas. The year could be summarized as being average regarding temperature but extremely dry and less than normal winds. Late winter was normal with occasional blowing or spitting snow, followed by periods of sunshine. March was dry with above average winds and perhaps foretold the moisture situation for most of the remaining year. Sharp freezes on April 20 and 21 probably retarded plant growth in the area. Rainfall was below normal during spring and early summer. We received only 4.16 inches of precipitation during the period March 1 - July 1, while normal precipitation totals 11.30 inches for that period. The rain received was in the form of scattered thundershowers which sped over the area and did little to relieve the dry topsoil conditions. July was hot with thirteen days of over 100°; August was cool. Over half of the year's rainfall, 8.47 inches, was received during July and August and soil moisture again was good. Thereafter, one of the driest falls on record followed with only 1.18 inches of precipitation received during the period September - November, a period normally yielding four inches of rainfall. Temperatures were mild, extending "Indian Summer" on



These water units (14a and b) received heavy waterfowl use until the freeze-up in December. Up to 30,000 ducks were counted on this double unit. MB, 11/9/66



This unit (28) was constructed in 1965 but was not used until this past summer and fall. It received heavy early duck use and will be one of our more attractive duck feeding and resting spots. Units 30 and 48 are visible in the background at left. MB, 11/9/66

into November. Partial relief from the drought finally came on December 27 when eleven inches of snow yielded 1.19 inches of precipitation.

B. Habitat Conditions.

1. Water. Water conditions have been less than desirable for most of the year. Rattlesnake Creek flow was normal during the winter and spring and the Little Salt Marsh held a normal amount of water. This, however, is where normalcy ends. The contract on last year's flood damage was not completed until the first week in May. Until that time, Unit 5 (Little Salt Marsh) and Unit 7 (Brown Quarter) were the only operable units. The others were inoperable because of direct flood damage to the dikes or damage to a control structure feeding the unit. Upon completion of the repair contract we were anxious to turn water into the units as the waterfowl nesting season was upon us. By that time, however, Rattlesnake Creek flow had dropped to less than 20 cfs due to the rainfall shortage and increased evaporation. Flow in the creek diminished until July 7 when the creek dried up completely. When we needed water the most we didn't have it or couldn't make use of what we did have. At the time of the dryup small amounts of water were in Units 5, 7, 10, 11, 14, 20, and 28.

The creek was dry until approximately five inches of rain fell during a two-week period beginning July 19. Rattlesnake Creek flow was estimated at 100 cfs on July 22 at which time water levels in the Little Salt Marsh (Unit 5, our main storage pool) had recovered sufficiently to turn some water to the other units. August was cool and moist and Rattlesnake Creek flowed at around 30 cfs for the month. The entire inflow was used to fill and maintain water units.

A dry September was a prelude to one of the driest falls on record. Rattlesnake Creek flow diminished steadily to less than 5 cfs by the middle of September. We continued to divert water out of Unit 5 to other units, however, as it was felt that water could best be used in the more shallow units further north which are more attractive to waterfowl earlier in the fall and winter before freezup. By the middle of November, Unit 5 had been drawn down eighteen inches below optimum water level for that unit; however Units 7, 10, 11, 14, 20, 21, 22, 23, 28, 30, and 48 had been filled and most were receiving heavy use by waterfowl.

By mid-November, as evaporation losses were reduced, Rattlesnake Creek flow started to increase even though little rainfall was received on the watershed. At that time it was decided to bring the level of Unit 5 back to normal to prevent wave and ice damage to the banks as the water level was below rip-rap placed around the unit. At year's end Unit 5 held an optimum amount of water as did the above mentioned units. In addition, Units 40 and 62 were being

filled to encourage waterfowl to utilize crops in that area.

Twenty of the twenty-five developed water units were holding water or filling at the end of the year. Planned development calls for an additional twenty units.

The Big Salt Marsh, as yet undeveloped, held a favorable amount of water until the summer drought, at which time surface acreage shrunk to about half its earlier size. The July and August rains replenished the Big Salt Marsh but it again shrunk until seepage from the surrounding sandhills returned water levels to normal in late fall. McCandless Lake, another presently uncontrolled lake, went dry in July and did not hold water the remainder of the year. North Lake held small amounts of water during the entire year.

Water level gauges are being installed on completed water units so records may be kept prior to the formulation of a water management plan.

2. Food and Cover. Food and cover were abundant for wintering populations of waterfowl and upland birds. Ducks and geese made heavy use of refuge maize and wheat fields and the quantity of food seemed to be adequate. Particularly hard hit by the spring migration of Canada geese was the winter wheat just north of Unit 5. This wheat recovered nicely after the geese left, however, and some of the best wheat seed production on the refuge came from these fields.

Fall migrating waterfowl fed on about the same areas as did the spring migrants, notable Unit 12, Unit 31, Unit 46, and Unit 36, all farming units. It is expected that other farming units will receive increased use when future development brings water units closer to them.

Food and cover for upland birds remains abundant despite the extremely dry conditions in the fall. Winter and early spring precipitation favored spring growth of upland grasses although the summer drought did hamper later grass development. Abundant upland food and cover were present in the fall and early winter thanks to proper range management.

No artificial feeding was undertaken except to bait waterfowl to the cannon net trapping sites.

II. WILDLIFE

A. Migratory Birds.

Geese. Canada geese numbered 7,500 at the year's beginning compared to 2,900 at the same time in 1965. Numbers rose steadily until 16,500 were present at the end of February. Winter wheat fields



Unit 48, shown here in November, supported as many as 20,000 ducks before the freeze-up in December. This unit, constructed in 1965, was first flooded this fall and promises to be one of our better water units. MB, 11/23/66

UNIT 48

just north of Unit 5 (Little Salt Marsh) were grazed heavily by the feeding geese. Off-refuge winter wheat south and southeast of the refuge also received goose-use. White-fronted geese arrived the first week in February and peaked at 14,500 the last week in February. The restless "specks" do not stay long at Quivira and were gone by the first week in April as were the Canada geese.

The fall goose migration began the third week in September when a lone Canada goose was sighted. Canada goose numbers were small until a significant buildup started the second week in November. The fall Canada goose population peaked at 4,500 birds on November 30. Foul weather then pushed almost half the geese south and our year-end total was 2,750 as compared to 5,200 last year. As usual this year's wintering geese were primarily small Canada geese probably Lesser and Richardson's. It is interesting to note that Cheyenne Bottoms Waterfowl Management Area, a state refuge twenty miles northwest of Quivira, winters practically all large Canada geese.

Fall migrating white-fronts were conspicuous by their absence. One hundred and forty-four were present on October 14 for the fall's peak population. Throughout the rest of the fall numbers varied from one to thirteen. This compares to a peak population of 408 the first week of October 1965. Several hundred were present for a short period of time at Cheyenne Bottoms, north of the refuge. Occasional snow and blue geese were sighted with the Canada geese. January-February banding operations netted 160 birds, all Canada geese.

Ducks. Mallards numbered 20,000 at the year's beginning as compared to 66,000 in 1965. This 66,000, however, was the peak last year while the peak in 1966 didn't arrive until the final week in February when 89,000 were present. The spring mallard migration pattern might be described as later and more intense than in 1965.

Pintails numbered almost 2,000 at the beginning of the year as compared to 500 in 1965. Little buildup was observed until the end of February when 100,000 were present. This compares to a peak of 62,000 at approximately the same date last year.

Other ducks migrated in their usual pattern, most species arriving in the middle of March and staying on until early summer. Duck nesting this past season was a disappointment, presumably because of the lack of nesting habitat. Last year's flood left us only two operable water units (5 & 7) in the spring and by the time the repair contract was finished and other units were operable our water supply had dwindled to a trickle (See Section B., 1). Production was estimated at two hundred seventy birds, divided between mallards and blue-winged teal. This is only a fraction of what can be expected in the future.

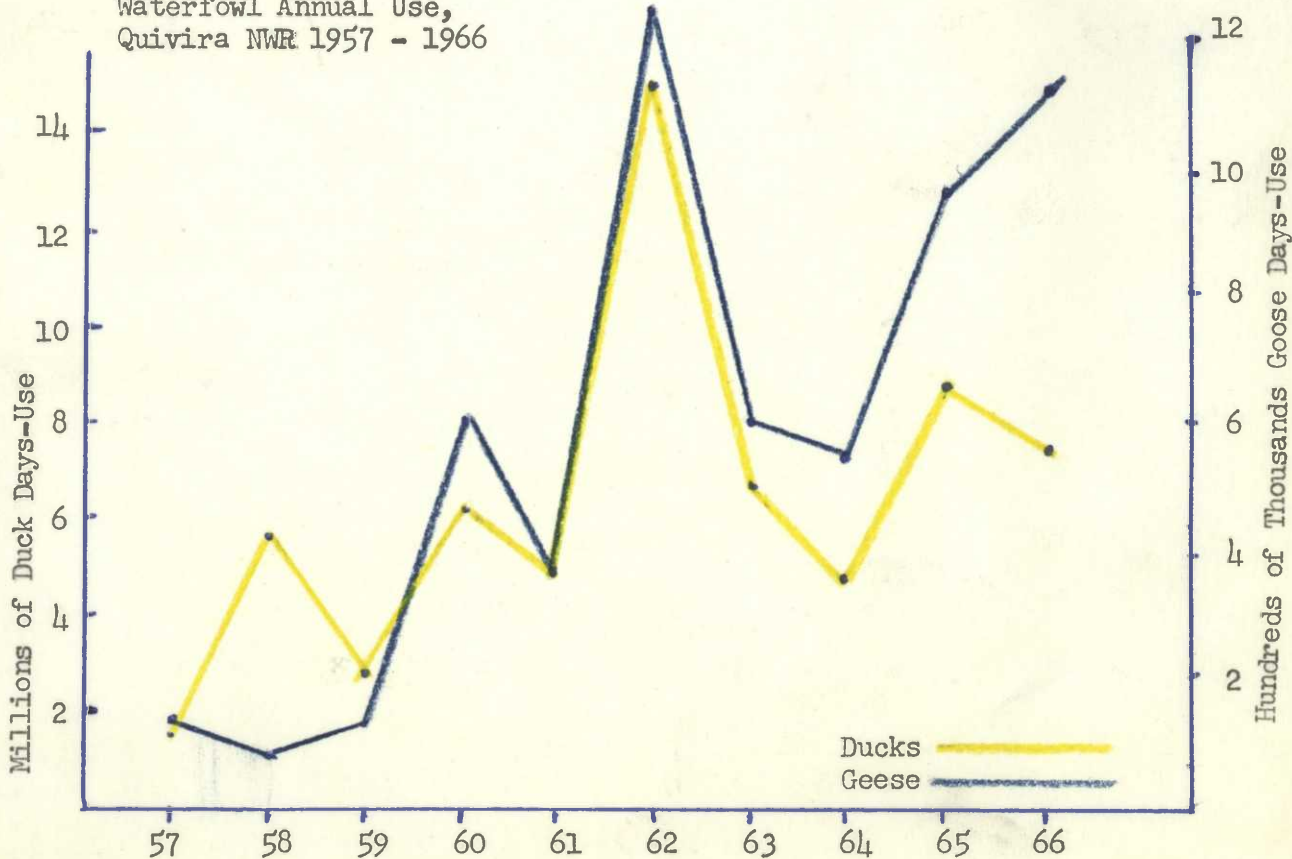
The early migration of pintails and green-winged teal began in the middle of August. Pintail numbers stayed at less than 1,000 until

mid-November when a slight increase was noted. Green-winged teal, however, increased sharply in mid-September to a peak of 12,725 birds. Last year green-winged teal did not arrive in significant numbers until late October as is usually the case. Mallard numbers increased gradually to a peak of 83,000 on December 15. By that time most other species had departed southward. The storm on December 27, which dumped eleven inches of snow and froze all water except about thirty acres on Unit 5, pushed some of the mallards out but by year's end 42,000 were still present.

Early migrants preferred to feed and loaf on the northern water areas of the refuge and as the season progressed, moved southward, mainly to Unit 5 (Little Salt Marsh). Ducks were content to feed on flooded units until November 29 when they were first observed feeding on refuge grain sorghum. Unit 12, adjacent to the Little Salt Marsh, was used heaviest at that time, but, as wind and snow toppled the milo in Units 12, 27, 31, and 36, making most of it unavailable, the feeding ducks moved primarily to Unit 46 where hardier stalks and a higher yield of milo provided a better food source. In December, daily flights of mallards journeyed to grain sorghum fields to the east and south of the refuge. The December 27 snowfall covered most of the off-refuge milo stubble and the feeding ducks returned to unharvested refuge milo.

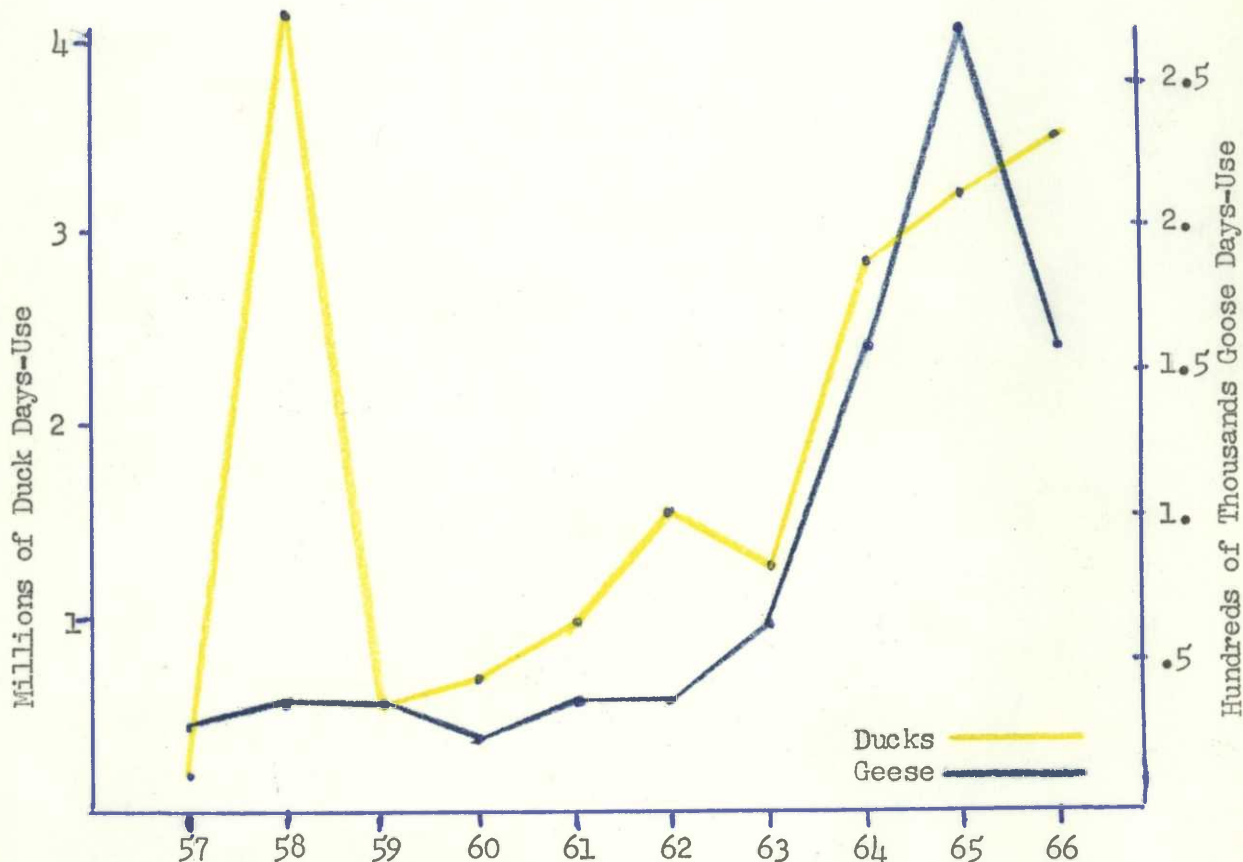
The following graph illustrates duck and goose use during Quivira's first ten years of existence.

Waterfowl Annual Use,
Quivira NWR 1957 - 1966



One of the primary objectives of Quivira is to provide food and rest for southward bound fall migrating ducks and geese. An indication of the success of this mission is plotted on the following graph which shows September - December use figures for Quivira's first ten years.

Waterfowl Use, Quivira NWR
1957 - 1966, September -
December period.



Other migratory birds. Daily checks were made for the presence of whooping cranes during their expected migration time but none were sighted and there were no reports from the surrounding area. Sandhill crane numbers and use greatly exceeded that of all previous years. Three to four thousand of the birds were present throughout November and utilized mud flats, freshly filled water units, pastures, wheat fields, and grain sorghum fields.

Migration patterns and peak numbers of other migratory birds did not vary significantly from previous years. Of interest, however,

is the increase in small shorebirds over the summer months, notably Baird's and least sandpipers. In spite of the adults present, shorebird reproduction was scant with only a few young killdeer sighted. Mourning dove numbers appear unchanged although drought conditions probably cut into the breeding population. Coo counts are planned for this spring.

A new species was added to the bird list when a western grebe (Aechmophorus occidentalis) was sighted on November 1 by Assistant Manager Brownlee. Another sighting, presumably the same bird in the same location, was made by Refuge Manager Darling on November 2.

B. Upland Game Birds.

The breeding population of bobwhite and ring-necked pheasant was believed to be the best in recent years, although as yet we have no formal census techniques. No flood waters were present this year to hamper nesting and production was excellent for both bobwhites and pheasants. The dry summer hampered seed production but upland bird populations were probably not adversely affected. We entered the winter with probably the highest quail and pheasant populations the refuge has yet experienced. No doubt there is some movement off the refuge as upland game bird populations continue to increase. Predation was minor and does not present a problem at this time.

C. Big Game Animals.

White-tailed deer are the only big game animals on Quivira Refuge. No formal surveys are made but the population appears to have increased considerably since the establishment of the refuge. Early morning sightings are almost a daily occurrence along the road adjacent to Unit 5. Eleven bucks, nineteen does, three yearlings, and seven fawns were noted in casual observations by Assistant Refuge Manager Brownlee during the period of March 1 - December 31. All animals appeared to be in good health. The refuge population is estimated to be seventy-five animals. Although the refuge coyote population is substantial, predation appears to be minimal.

D. Fur Animals, Predators, Rodents, and Other Mammals.

The fur animal population is low but will probably increase as more water units are added. Beavers are already on the increase. A colony has started on Unit 10b (Horseshoe Lake) and measures will probably have to be taken to prevent their making a water distribution system of their own. Beavers have also worked along Rattlesnake Creek, the C-line canal, and around structure A-3 on the Little Salt Marsh. As water units become active and emergent vegetation increases muskrats are expected to increase although the present population is not significant. Striped skunks are numerous and badgers appear to be increasing. Occasional mink and long-tailed weasels are sighted. Although coyotes are numerous, predation losses are

small and no doubt these canines are helpful, at their present level, in holding the rodent population in check. The southern end of the refuge is only two miles wide; consequently a constant on and off movement of the coyote population is possible.

Black-tailed jackrabbits are seldom seen on the refuge but there are indications of increasing numbers on adjacent areas. Cotton-tails are numerous and appear to be about holding their own. Kangaroo rats are also numerous and present some problems by burrowing into canal banks and around buildings.

Black-tailed prairie dogs appear to be increasing. Two more towns were included in this year's land acquisition and four colonies are now thriving within the refuge boundary.

E. Hawks, Eagles, Owls, Crows.

Eagle numbers were disappointing. Thirty-one eagles were present at the beginning of the year compared to fifty-six bald eagles and six golden eagles in February 1965. The largest number present in the fall migration was nine bald eagles and six golden eagles, both observations recorded on December 22. Little use was made of the two traditional roosts; one located on the refuge, the other adjacent to it. The majority of the birds are immature birds as in the two previous years. The total number of eagles has decreased rather than increased as expected during the last few years.

Marsh hawks and ferruginous hawks were abundant during the winter months at the beginning of the period. Swainson's hawks were present in their usual abundant numbers during the summer months. Red-tailed hawks were present in small numbers during the summer months and a few were present at the year's end. The fall hawk migration was predominately made up of marsh hawks and sparrow hawks. A few rough-legged hawks and ferruginous hawks were present. An occasional prairie falcon was seen but no peregrine falcons were observed.

Great horned and short-eared owls are sighted occasionally and the population doesn't appear to have changed substantially. Burrowing owls were abundant around the prairie dog towns during the summer but the population characteristically dropped off during the winter months.

The crow population appears to have significantly decreased. In previous years it was not uncommon for several hundred thousand to roost along the eastern boundary of the refuge. Such was not the case this year nor did the number of crows present remain as long in the area.

F. Other Birds.

Song bird numbers do not appear to have changed. The Audubon



Structure DC-B, shown here under construction in August, is a box culvert under the K-19 extension highway. Regional Office Engineer Charlie Bostick (in blue jacket) inspects the progress. MB, 8/12/66



This is structure DC-B after completion. The metal culvert at left drains the highway borrow ditch. MB, 8/30/66

Society Christmas Bird Count revealed thirty-eight species and 79,917 individuals. The complete list may be found at the end of this report.

G. Fish.

As all other water units were inoperable until summer, Units 5 and 7 were probably the only units containing fish. Channel catfish, bullheads, and carp were abundant and it was a daily chore to raise the radial gates leading out of Unit 5 to clean out the small fish caught under the gates. The refuge is, as yet, not open to fishing.

H. Reptiles.

Our only poisonous snake, the western massasauga, was seen frequently during the summer months. Several were dispatched around the refuge shop and Quarters Q-56. Bull and water snakes were common around water control structures while garter snakes and hog-nosed snakes were common on uplands. Ornate box, musk, and mud turtles are common along the roads. Several common snappers, weighing in the vicinity of twenty pounds, were killed whenever found. Soft-shelled turtles were commonly seen during the summer months sunning themselves on dikes and snags within the water units.

I. Disease.

Nothing to report.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development & Maintenance.

The third construction year was completed in October with the construction of Units 40 and 62 and the Darrynane canal and associated structures. The Darrynane Canal is slightly less than four miles long. It extends from Darrynane Lake northward along our east boundary and will supply water to six units. In addition, the dike at Darrynane Lake was revamped and water control structures installed for the new canal and Rattlesnake Creek which flows through the lake. The twenty-five major water units now in operation have a potential of 3,044 surface acres.

Contract work commenced on March 9 to repair damage caused by the 1965 flood. Although it was a relatively small contract, the work was vital as most of our water units were inoperative because of the damage (See Section I, B, 1). The work was completed in early May.

Electric fences were erected and maintained to protect new construction from grazing cattle. As construction continues more raw



The Darrynane Lake Overflow, shown here under construction, is equipped with dropboards and will regulate the water level in Darrynane Lake. Drainage flows into Rattlesnake Creek. MB



The new "Finn" mulch spreader operating on the newly constructed Unit 62 dike. Five men are required to run the machine plus two or three to supply hay to it. This year's operations consisted primarily of experimentation. MB, 11/23/66



The newly constructed Darrynane Canal supplies water to six units in the northeast portion of the refuge from Darrynane Lake. Slopes and dike tops were later planted with a grass seed mixture. No water was available for release before the end of the year. CD, 9/2/66



Structure DC-A at Darrynane Lake will be the control structure for the canal pictured above. MB, 8/30/66

dikes and canals must be protected from grazing cattle by electric fences as permanent fence construction cannot keep up with new dike and canal construction. This year approximately fifteen miles of electric fence were in operation requiring 179 man-days to erect, maintain, and remove. It becomes debatable whether the benefits derived from grazing particular units during the period between new construction and permanent fence erection is sufficient to offset the output of materials and labor necessary to maintain electric fences.

A "Finn" mulch spreader was procured in April for the purpose of spreading hay mulch on new construction to prevent wind and water erosion. This year's activities with the spreader were for experimentation. A minimum of seven men is required to run the machine and supply it with hay so labor restrictions have hampered its use. Approximately 6,700 bales of native hay have been baled, both off and on the refuge, and stacked at strategic locations along new dikes and canals for future use in the machine. Three wagons were bought and beds constructed for hauling the hay. A "Klodbuster" was acquired in March to dress the dike and canal slopes prior to grass seeding and subsequent mulching.

Interior permanent fence construction consisted of one mile to the Unit 7 dike, one and one-half miles to the west and south sides of Unit 39, and three-fourths mile to separate Unit 15, a grazing unit, from Unit 16, a water unit. Preliminary work was started on two and one-quarter miles of boundary fence along the north side of Unit 64 and the west side of Unit 79.

Part of the funds earmarked for flood damage repair was expended to purchase and haul 3,140 yards of road surfacing material to two miles of township road which were damaged by the 1965 flood waters. A short road was constructed by force account from the headquarters entrance road to the oil house and gas pump. The headquarters road system was covered with 408 yards of clay-ball material.

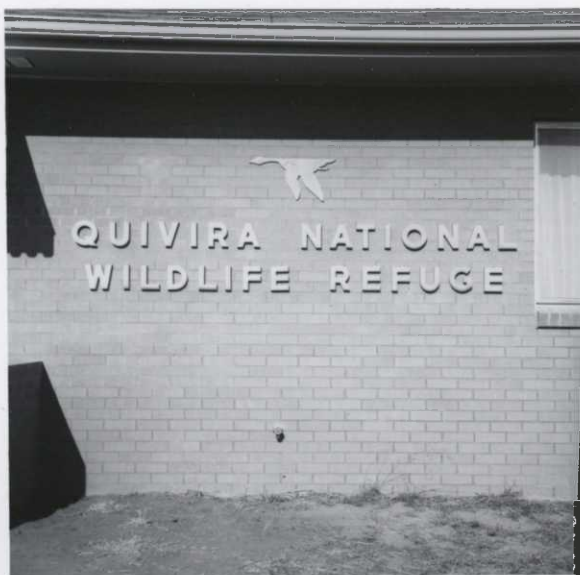
In June and July, a system of sidewalks totaling 3,473 square feet was constructed between refuge headquarters, Quarters Q-261 and 262, and the oil house. Clearing and grading was performed by refuge personnel and the cement work by a local contractor.

Cast aluminum letters reading "Quivira National Wildlife Refuge" and a cast aluminum "Blue Goose" were purchased and attached to the front of the office building. These attractive letters enhance the office building appearance. An aluminum flagpole, thirty feet in height, was acquired and installed at refuge headquarters. An aluminum awning was also purchased and attached above the entrance door at refuge headquarters.

Equipment repairs other than normal maintenance included a major overhaul to the Dodge powerwagon, installing a rebuilt engine in



A thirty foot flagpole was installed in front of the office building in early December. In addition, cast aluminum letters reading "Quivira National Wildlife Refuge" and a cast aluminum "blue goose" were attached to the front of the office building. MB, 1/13/67



A close-up of the new aluminum letters and "blue goose". The pattern for the goose was furnished by the Washita Refuge and the letters and goose were cast by the Metalarts Corp., Milwaukee, Wisconsin. MB, 1/13/66

the Ford tractor and rebuilding the transmission of the No. 12 Motor Patrol.

As water units became operational, flashboards were constructed for insertion into the water control structures.

B. Plantings.

3. Upland Herbaceous Plantings. Sixty-five acres of sand dunes and upland grasslands were seeded with a mixture of one-half pound weeping lovegrass, one pound sand love, and one and one-half pounds blackwell switchgrass. This year's results were practically nil, but should improve if adequate rain falls in the spring of 1967. Fiscal year 1966 construction projects were also seeded with the same mixture plus one-half pound of alfalfa seed.

4. Cultivated Crops. Our 1965-66 wheat allotment of 500 acres was utilized by farming 120 acres with refuge equipment and 380 acres under cooperative farming agreement. The frost on April 21 and the high wind and hail of April 29 damaged the wheat crop and only a total of 1,300 bushels were delivered to refuge bins. Farming Unit 12 was utilized heavily by feeding geese but recovered nicely and yielded some of our best wheat. Unit 46 was again used heavily by the geese. The 1966-67 wheat allotment of 600 acres includes 440 acres under cooperative farming agreement and 160 acres farmed by refuge equipment. Much of the increase is due to newly acquired farm land in the Rice County section. Two hundred fifty acres of wheat were planted by the refuge staff, but ninety acres will be plowed under for green manure after the geese have left in the spring of 1967.

Three hundred forty acres of grain sorghums were farmed under cooperative farming agreements. One third was left standing in the field for wildlife use. In addition, 160 acres of milo were farmed by refuge personnel. This was an excellent year for milo after portions were replanted following the April 29 storm which washed some milo out. July and August rains were well spaced and a bumper crop of milo was raised. Yields of fifty bushels to the acre were not uncommon. One-fourth of the milo planted by refuge personnel in Units 36, 46, and 31 was harvested. The milo was cut in strips to minimize winter wind erosion and provide landing strips for waterfowl. The stubble strips were later mowed to improve the runways. As most of the present development is in the southern part of the refuge, waterfowl use is correspondingly heavier there. Unit 46 received the heaviest use, followed by Units 31 and 36. Waterfowl were not seen feeding on Unit 32 (Hess Quarter) during the fall and winter and only once on Unit 27. The heaviest use on cooperatively farmed milo fields occurred on Unit 12 adjacent to Unit 5 (Little Salt Marsh).

The eight acres of Elbon rye planted in the fall of 1965 received good goose use in the spring of 1966 and eight acres were harvested

and yielded about sixty bushels. The plot was again planted this past fall. In addition, fifty acres of strips not planted to wheat on Unit 52 were planted to rye. This rye will be plowed under in the spring of 1967 to make way for grain sorghum and fallow to establish a crop rotation on this particular unit. The Elbon rye received little use during the fall and winter months because of the drought-caused lack of green vegetation. In normal years, however, Elbon rye should be a good cold weather browse plant.

C. Collections and Receipts.

1. Seed or other Propagules. Cooperatively farmed wheat harvested from the 1965-66 crop brought 800 bushels to the refuge bins. In addition, 500 bushels were harvested from refuge farmed fields. Nine hundred bushels of refuge farmed milo were harvested and put in the refuge bins for banding bait because of the short wheat crop and the excellent milo crop. Wheat is usually used for baiting. The refuge share of the cooperatively farmed milo was left standing in the field for use as wildlife food. Two hundred pounds of blackwell switchgrass and fifty pounds of a big bluestem-Indiangrass mixture were collected as the refuge share of the grass seed harvest.

D. Control of Vegetation.

Mechanical control of vegetation consisted of mowing forty-five acres of upland grasslands for control of weeds and to conserve moisture. In addition, all canal banks and dikes were mowed to control weeds and promote the growth of desirable upland plants. All mowing was accomplished by refuge personnel using the Servis rotary mower and the Ferguson sickle bar mower.

One hundred fifteen acres of salt cedar (Tamarix gallica) were cut, either by hand or rotary mower, and the stumps treated with 2,4-D butyl ester at an approximate rate of .50 lb. A. E./acre. Diesel fuel and water were carriers. Treatment took place from April to June at all stages of growth. Application was by power spray unit or by hand spray unit in inaccessible areas. Kill was apparently good at the end of the growing season; however some regrowth will probably occur next year and continuing control measures will be required. No chemical control was performed in 1965.

Approximately five acres of Fremont cottonwoods (Populus fremontii) and scattered Russian olives (Elaeagnus angustifolia) were controlled by the same methods listed above. The cottonwoods were located along the F-line canal and the Russian olives along Rattlesnake Creek where it enters the refuge. Kill was apparently good although future control will also be necessary.

The following is a cost breakdown of 1966 chemical vegetative control.



Shades of the Wichita Mountains. This unregistered Texas longhorn steer belongs to Glenn McMurphy, a grazing permittee. He is used as a lead steer to guide angus cattle to and from the pasture. The old boy, reportedly twelve to fourteen years old, has made the trip many times. MB, 8/19/66



Cattle grazing is one of Quivira's many uses. These cattle belong to Park Smith and were grazed under permit in Units 14 and 19. Six hundred and six cattle were grazed on Quivira this past summer for a total of 6,030 AUM's. MB, 8/15/66

Labor - 334 man hours	\$714.00
Diesel fuel - 157 gal. @ .135	21.20
2,4-D butyl ester - 10.5 gal. @ 3.70	38.85
Equipment operation	100.00
Total	\$ 874.05

E. Planned Burning.

Tumbleweeds were burned in the C-line canal on May 23. No other planned burning.

F. Fires.

There were no fires on the refuge or adjacent land areas. Fire fighting equipment was maintained for readiness throughout the year because of drought conditions.

IV. RESOURCES MANAGEMENT

A. Grazing.

Grazing units remained in good condition despite the dry season. Two additional pastures totaling approximately four hundred acres which were acquired since the 1965 grazing season were included in this year's operations. One was in very good condition and the other had less desirable grazing but cattle were already present when acquired. A total of sixteen permittees grazed 606 head for 3,030 AUMs during the five month grazing period.

B. Haying.

Special use permits were issued to ten permittees who harvested 498.6 tons of native hay. The yield per acre was comparative to last year. Two of the permittees also harvested 33.7 tons of alfalfa hay from fifty-five acres; insufficient rainfall reduced the alfalfa harvest more than ten tons from last year.

Two informal contracts were made for cutting and baling approximately ninety-three tons of hay for future use in mulching new dikes. This hay was cut from a unit which is to be flooded and part of a haying unit which was not cut by a permittee during the summer.

C. Other Uses.

Oil exploration and drilling activity increased during the year. Areas which were formally considered unlikely for oil production or had produced only dry holes, began producing by improved drilling methods. A former dry hole in NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ S14, T21S, R11W was washed down and became a producer at 3,110 feet in mid-July. However an offset well south of this location in SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 23 was considered a dry hole in mid-November as well as a location west of the

producer and off the refuge. A dry hole was drilled in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 18, T21S, R10W, the Rice County Section. A dry hole drilled in 1953 along the south end of the Big Salt Marsh in NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 33, T21S, R11W was washed down but it remained a dry hole.

The Raymond Oil Company drilled three successful oil producing wells in SE $\frac{1}{4}$ Sec. 21, T21S, R11W in the northern limits of the Big Salt Marsh. Each of these is pumping from two depths. Raymond Oil also had a dry hole in SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 22 which is used as a disposal well along with a tank battery for the three producers on land which is scheduled for acquisition.

Aspen Drilling Company offset a former dry hole south of the Raymond discovery and made an oil producer in SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 28, T21S, R11W; they were successful with an offset in NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ of that section. Additional drilling is expected along the northwest side of the marsh. Aspen was unsuccessful after drilling to 3,580 feet northwest of the refuge shop in NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ Sec. 11, T22S, R11W at the end of the year.

The six successful wells during 1966 made a total of eleven oil wells within the present refuge boundaries. The former land owners retained all royalties from these wells.

Refuge receipts during the year are tabulated below.

Grazing, 3030 AUMs @ \$2.25	\$6,817.50
Hay, native - 498.6 tons @ \$1.50	747.91
Hay, alfalfa - 33.7 tons @ \$3.00	101.30
Sale of surplus farm buildings	372.52
Sale of junk metal	67.64
Dividend, Zenith Cooperative Grain Co.	18.68
Seismograph Exploration - 9 shot holes	90.00
Total	\$8,215.55

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report.

Personnel and time were not available to continue progress on the refuge herbarium.

VI. PUBLIC RELATIONS

A. Recreational Use.

Recreational areas have not been developed on the refuge. Most recreational use is on a drive-through basis and consists of local residents stopping by for a look at the birds.

The Quivira Field Trial Club, Inc. held field trials on the refuge on February 19-20. Fifty people were present from as far as Denver, Kansas City, and Oklahoma City. Thirty-four dogs were entered.

The Jayhawk Retriever Club of Wichita, Kansas held an American Kennel Club licensed retriever trial on the refuge March 25-27. Two hundred forty-five people were present and it was termed a big success by the officials present. In spite of the fire hazard we had no fires or trouble of any kind.

On October 30, the annual Hamilton-Duggan Trail Ride went through the refuge with a stop for lunch at the farming headquarters. Sixty-nine riders took part in the ride.

B. Refuge Visitors.

<u>Date</u>	<u>Name</u>	<u>Organization</u>	<u>Purpose</u>
1/6/66	T. E. Conrardy	BSFW, Albuquerque	Check boundaries
1/6/66	Bill Stabler	BSFW, Albuquerque	Check boundaries
1/7/66	R. E. McWhorter	Kans. For., Fish & Game Comm.	Courtesy
1/7/66	R. O. Hager	"	Courtesy
1/17/66	Truman Fergin	RBS, Tulsa, Okla.	Corps of Eng. desalinization proj.
2/4/66	Jim Fugate	Gt. Bend Tribune	Eagle story
3/16/66	Bob Cameron	SCS Soil Con.	Scout camp
4/5/66	Ed Gebhart	State Game	Courtesy
	Glenn Hurst	Protectors	
4/20	George C. Moore	Director, Kans. For., Fish & Game Comm.	Midwest Reservoir Project
6/1/66	Marvin Lundquist	Sandyland Exp. Sta., St. John, Kansas	Range Study
	Rae Luginsland	Reno Co. Ext. Serv.	" "
	Henry Deutsch	State Forrester	" "
	Don Peterson	Stafford Co. Agent	" "
7/13/66	Rodger Johnson	Biologist, RO	Refuge Familiarization
7/26/66	Dale Smith	SCS, St. John, Ks.	SCS inventory
8/9/66	Stephen Capel	Kans. For., Fish & Game Comm.	Pick up dead deer
8/25/66	Fred Bolwahn	Ref. Mgr. Salt Plains	Wheat pickup
10/17/66	Terrence Merkel	Fish. Biol., Mescalero, New Mexico	Fisheries studies
11/15/66	Bob Stratton	Asst. Mgr., Salt Plains	Milo pickup

C. Refuge Participation.

The following is a tabulation of refuge participation for 1966. The participants are noted by initials as follows: Joshua J. Harman - JJH; Charles R. Darling - CRD; Ronald S. Sullivan - RSS; Michael B. Brownlee - MBB; Wayne E. Dale - WED.



The District Land Judging School was held on Quivira on July 8-9. Refuge Manager Darling is pictured above with the group. Can you find him? MB, 7/9/66

<u>Date</u>	<u>Organization</u>	<u>Number Present</u>	<u>Type of Program</u>	<u>Participant</u>
1/17	Hillcrest Rural PTA	53	Conservation Program	JJH
2/3	Methodist Men's Group Lyons, Ks.	27	Film presentation	JJH
2/28	YMCA, Langdon, Ks.	75	Slide Talk	RSS
3/17	Cheyenne Bottoms Sports- men's Club, Gt. Bend	14	Film & Talk	JJH
4/12	Stafford Rotary Club	25	No Program	JJH, CRD, MBB, WED
4/22	St. John 5th Grade Class	47	Refuge Tour	CRD
6/2	Community Church of the Brethern	15	Refuge Tour	MBB
6/17	Stafford Grade School	10	Refuge Tour	CRD
7/8	District Land Judging School	28	Range School (Refuge)	CRD, MBB
7/15	Pratt High School Biology Class	10	Refuge Tour	CRD
9/11	Catholic Men's Club St. John, Ks.	18	Talk	CRD
9/14	Stafford Embroidery Club	12	Refuge Tour	CRD
9/15	Lions Club, Stafford	40	Talk	CRD
9/26	Garden Club, Stafford	13	Refuge Tour	WED
9/28	Wheatland Elementary School, Ellinwood	60	Slide Talk	CRD
10/4	Riverside Garden Club Sterling, Ks.	32	Slide Talk	CRD
10/17	Hi-Y Club, Alden H.S.	40	Film Presentation	CRD
11/1	Ellinwood Rotary Club	30	Talk	CRD
12/7	Methodist Men's Club Larned, Ks.	23	Film Presentation	CRD
12/2	Optimist Club Stafford, Kansas	45	Talk	CRD

D. Hunting.

No portions of the refuge are, as yet, open to hunting. The refuge does provide hunting, however, as the birds move off to feed. Goose shooting was especially good south of the refuge when the geese went out to feed on green wheat located there. Near sundown it was not uncommon to see eight to ten carloads of hunters lined up on our south boundary waiting for the geese to make their exodus. One local hunter killed eighteen geese in the vicinity of the refuge this fall and another fourteen, but these are probably the most active hunters in the area.

The early teal season was met with little enthusiasm around Quivira although a good number of green-wings were in the area. The regular duck season opened with more interest and duck hunting was good throughout most of the fall. Practically all of the duck habitat around the refuge, except milo fields, is under lease to private hunting clubs or individuals.

Quail hunting around the refuge was excellent this fall, particularly along our east boundary. Pheasant hunting adjacent to the refuge was mediocre at best as was dove hunting.

E. Violations.

Nothing to report.

F. Safety.

Four safety meetings were held during the past year. Regional and Washington Office material was discussed along with local problems. Round table discussions usually followed and on-the-job discussions were frequent.

One no-lost-time accident occurred when Assistant Manager Brownlee fell from the Unit 14c overflow structure in August and broke a rib.

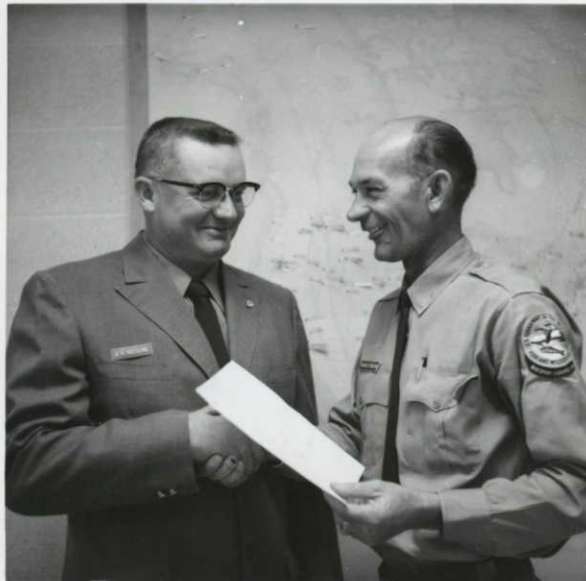
A shield was fabricated for installation on the rear of the Case 411 tractor to prevent debris from striking the operator while using the rotary mower. This is particularly necessary since we are involved in the control of salt cedar by mowing and flying pieces of wood are not uncommon.

Our current safety record stands at 555 days without a lost-time accident. Regular safety meetings are planned for 1967.

VII. OTHER ITEMS

A. Items of Interest.

Land acquisition speeded up considerably the past year. Title was vested in the United States to Tracts 5, 6, 6a, 24, 24a, 26, 33, 36, 46a, and 96 for a total of 6,006 acres. Nine hundred sixty acres



Maintenanceman Darrell Keesling received his 10-year pin and a letter of congratulations from the Regional Director on December 2. Refuge Manager Darling made the presentation. MB, 12/2/66

remain to be acquired in four tracts.

Maintenanceman Darrell Keesling completed ten years of service on November 23 and received his ten year pin on December 2 with appropriate fanfare from the local press. Darrell has been an asset to the refuge having earned several incentive awards and doing an all around good job.

Refuge Manager Jim Harman transferred to the Regional Office as Assistant Refuge Supervisor on April 4. He was replaced by Charles R. Darling who transferred from Wichita Mountains and now makes his home on the refuge. Assistant Refuge Manager Ron Sullivan transferred to Brown's Park on March 14 and was replaced by Mike Brownlee who transferred from the Imperial Refuge. Mr. Brownlee also lives on the refuge.

Most of this report was written by Assistant Manager Brownlee. Refuge Clerk Wayne Dale prepared the NR Forms, supplied varied details, confirmed statistics, and typed the report.

B. Photographs.

Credit for the photographs appearing throughout the report are noted by initials. Most of them were made as the opportunity arose but special efforts were necessary in a few cases.

Respectfully Submitted

Charles R. Darling

Charles R. Darling, Refuge Manager

January 25, 1967

Reviewed By:

William J. Kummer
Regional Director

Date:

2/8/67

Reviewed By:

Date:

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF January TO April, 19 66

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	7541	7200	11561	12000	12000	12320	12700	16500	4300	9065
Cackling										
Brant										
White-fronted					2	6135	11000	14500	1000	35
Snow										
Blue										
Other										
Ducks:										
Mallard	19689	27474	45000	4000	4000	30000	54000	89300	10000	5719
Black										
Gadwall										188
Baldpate	83						500	3000	1000	21
Pintail	1943	1000	250	100	100	15000	59000	100000	20000	2371
Green-winged teal	2125	475	450	100	400	2000	5200	5500	1000	1512
Blue-winged teal										
Cinnamon teal										
Shoveler										152
Wood										
Redhead										6972
Ring-necked										
Canvasback										
Scaup										2329
Goldeneye			10	25	25					17
Bufflehead										
Ruddy										
Other Common Merganser	89	385	225	100	100	185	150	175	100	873
Coot:										

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF January TO April, 1966

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	1000	511	89						719,132		
Cackling											
Brant											
White-fronted	120	100	1						230,251		
Snow											
Blue											
Other											
Ducks:											
Mallard	1928	1135	724	67	302	265	60		2,057,711		
Black											
Gadwall	267	150	655	785	905	755	755		31,360		
Baldpate	616	398	193	595	375	275	195		50,267		
Pintail	729	265	383	175	915	127	35		1,130,051		
Green-winged teal	626	196	795	2360	2785	380	510		187,208		
Blue-winged teal	22	375	297	755	735	510	875		25,193		
Cinnamon teal											
Shoveler	723	1150	2605	1175	2275	1037	595		70,084		
Wood											
Redhead	2112	3050	2131	35					102,310		
Ring-necked											
Canvasback	15	50	50	10		2			1,099		
Scaup	661	300	392	155	25	60	125		28,329		
Goldeneye	56								931		
Bufflehead		180	315	12	58	50			1,515		
Ruddy	26	50	15	30	95	370	340		6,692		
Other	316	150	10						20,279		
Coon:	375	700	1010	575	2650	1650	960		55,650		

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans				Principal feeding areas <u>Green wheat fields, milo</u>
Geese	<u>949,683</u>	<u>31,000</u>		<u>fields</u>
Ducks	<u>4,005,069</u>	<u>197,975</u>		Principal nesting areas _____
Coots	<u>55,650</u>	<u>2,650</u>		

Reported by Charles R. Darling, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF May TO August, 1966

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
	:	:	:	:	:	:	:	:	:	:
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	242	93	75	50	165	184	210	195	165	187
Black										
Gadwall	580	835	670	272	110	85	63	44	21	20
Baldpate	137	140	110	85	25					
Pintail										
Green-winged teal	200	250	210	95	40					
Blue-winged teal	635	584	450	142	420	317	375	410	440	390
Cinnamon teal										
Shoveler	490	481	340	145	165	170	150	120	100	50
Wood										
Redhead				2						
Ring-necked										
Canvasback										
Scaup	4			4						
Goldeneye										
Bufflehead										
Ruddy	102	50	25	5	10	15				
Other										
Coots	575	500	340	205	110	75				

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF May TO August, 19 66

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimate seen : total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	210	198	201	189	225	188	205	225	22,449	4	90
Black											
Gadwall	20	10	5	10	15	2	10	10	19,171		
Baldpate									3,179		
Pintail						20	40	50	770		
Green-winged teal						240	350	520	13,335		
Blue-winged teal	350	340	300	280	300	200	210	165	11,156	7	180
Cinnamon teal											
Shoveler						2			15,491		
Wood											
Redhead											
Ring-necked											
Canvasback											
Scaup									56		
Goldeneye											
Bufflehead											
Ruddy						1			1,119		
Other											
Coot:						4	10	20	12,873		
				(over)							

(5) (6) (7)
Total Days Use : Peak Number : Total Production

SUMMARY

Swans : :
Geese : :
Ducks 120,659 : 2,433 : 270
Coots 12,873 : 575 : none

Principal feeding areas Units 5,11a,11b,20a,20b,21,66,78

Principal nesting areas Units 5,11a,11b,21,66

Reported by Charles R. Darling, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

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- (2) Weeks of Reporting period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750
Form NR-1
(Rev. March 1953)

W A T E R F O W L

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF September TO December, 1966

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
	:	:	:	:	:	:	:	:	:	:
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada			1		19	36	35	37	67 1/2	153
Cackling										
Brant										
White-fronted							1 1/4	90		
Snow										1
Blue										1
Other										
Ducks:										
Mallard	225	290	195	95	600	240	1075	1 1/2	2750	12300
Black										
Gadwall	10	50	215	50	150	575	250	31	270	1,50
Baldpate			270	100	175	1365	2525	130	250	1,05
Pintail	50	635	685	600	935	905	900	515	955	1,15
Green-winged teal	520	3900	12725	2675	5300	2390	3,150	11,63	1775	710
Blue-winged teal	165	1325	1015	2060	3800	1315	2575		515	
Cinnamon teal										
Shoveler			2	90	180	100	550	70	235	950
Wood										
Redhead			5			8	25	1 1/2	30	12
Ring-necked					6	1 1/2	205	10	6	2
Canvasback										
Scaup							25	19		
Goldeneye										
Bufflehead								2	2	18
Ruddy				5	25	15	10	29	28	185
Other										
Coot		1	30	175	1930	1175	2270	61	1125	1160

3-1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Quivira Nat'l. W/L Refuge, Stafford, Kansas

MONTHS OF September TO December, 19 66

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods Estimated seen total	
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	1580	3115	3883	1555	2735	2190	3720	2750	182,791		
Cackling											
Brant											
White-fronted		13	5	5			1		1,806		
Snow		1	2	1			1		12		
Blue		1							11		
Other											
Ducks:											
Mallard	10515	25980	52700	51955	111900	82700	71212	12000	2,829,218		
Black											
Gadwall	135								15,302		
Baldpate	150	1500			200				53,690		
Pintail	1610	2505	2300	175	810	1150	150	200	115,395		
Green-winged teal	1375	3777	1050	300			2		289,870		
Blue-winged teal									89,810		
Cinnamon teal											
Shoveler	1185	1160	595	100		30	1		40,936		
Wood											
Redhead	51	52							1,400		
Ring-necked	10	6		25	10				2,268		
Canvasback		2							11		
Scaup									308		
Goldeneye							10		70		
Bufflehead	140	211	365	90	95	55	32		6,601		
Ruddy	205	62	115	15	8				4,911		
Other		2			360	300	200		6,031		
Comm. Merg.											
Red-breasted Merg.		3	55	15	15				616		
Coot:	1075			15	5				63,151		
					(over)						

	Total Days Use	Peak Number	Total Production
Swans			
Geese	184,653	4,561	
Ducks	3,456,446	84,535	
Coots	63,154	2,270	

SUMMARY

Principal feeding areas green wheat fields and milo fields.

Principal nesting areas _____

Reported by _____

Charles R. Darling, Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.
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- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
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- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C.
1953

(over)

(Aug. 1952)

(Other than Waterfowl)

Months of January

to April

19 66

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	15	3/13	500	4/30	500
White-winged dove					4/30
					750
IV. Predaceous Birds:					
Golden eagle	1	1/1	1	1/1	1
Duck hawk					3/20
Horned owl	30	in residence			
Magpie					
Raven					
Crow	50	1/1	400	3/10	100
Bald Eagle	24	1/1	31	1/13	1
Sharp-shinned Hawk	4	1/1	25	3/10	1
Cooper's Hawk	40	in residence			
Swainson's Hawk	2	4/8	25	4/30	25
American Roughleg	10	1/1	10	1/1	1
Prairie Falcon	2	1/1	3	3/5	1
Marsh Hawk	20	1/1	20	1/1	1
Red-tailed Hawk	6	1/1	6	1/1	1
					3/10
					Reported by

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751

Form NR-1A

(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Quivira NWR, Stafford, Ks. Months of May to August, 1966

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
Eared Grebe	Present		25	5/12	4	5/12				150
Pied-billed Grebe	3	8/19	60	5/1	Present					3000
White Pelican	Present		175	5/12	25	6/8				2250
Great Blue Heron	Present		50	8/31	Present					3000
Green Heron	Present		65	8/31	Present					2400
Little Blue Heron	6	8/22	6	8/22	Present					50
Snowy Egret	6	8/19	6	8/19	Present					60
B-C Night Heron	Present		50	8/31	Present					2400
Least Bittern	1	8/19	1	8/19	1	8/19				5
American Bittern	Present		10	7/28	Present					600
II. <u>Shorebirds, Gulls and Terns:</u>										
Snowy Plover	Present		100	7/25	Present					6000
Killdeer	Present		50	8/31	Present					3500
Black-bellied Plover	4	5/12	4	5/12	4	5/12				5
Ruddy Turnstone	4	5/25	4	5/25	4	5/25				5
Long-billed Spring	Present		5	5/1	1	5/12				
Curlew Fall	6	8/4	6	8/4	Present					100
Spotted Sandpiper	Present		10	5/1	2	5/25				100
Greater Yellowlegs	Present		500	8/31	Present					6000
Lesser Yellowlegs	Present		75	5/12	Present					3500
Pectoral Sandpiper	Present		375	5/12	375	5/12				3500
Baird's Sandpiper	Present		453	5/12	Present					20000
Least Sandpiper	Present		550	5/12	Present					25000
Dowitcher	Present		975	5/12	Present					10000
Semipalmated Sandpiper	Present		75	5/25	75	5/25				2500
Marbled Godwit	1	5/5	1	5/5	1	5/5				5
Avocet	Present		42	5/12	1	6/8				500
Wilson's Phalarope	Present		1800	5/12	(over)	5/25				10000

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons: Mourning dove White-winged dove					
IV. Predaceous Birds: Golden eagle Duck hawk Horned owl Magpie Raven Crow					
Reported by _____					

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (1) **Species:** Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) **First Seen:** The first migration record for the species for the reporting period.
- (3) **Peak Numbers:** Estimated number and inclusive dates when peak population of the species occurred.
- (4) **Last Seen:** The last refuge record for the species during the season concerned.
- (5) **Production:** Estimated number of young produced based on observations and actual counts.
- (6) **Total:** Estimated species days use (average population X no. days present) of refuge during the reporting period.

Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge Quivira NWR, Stafford, Ks. Months of May to August, 1966

[illegible]

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Present	3300	8/25	Present	600
White-winged dove					130,000
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl	Resident	10			1,200
Magpie					
Raven					
Crow	Resident	50		Present	3,600
Turkey Vulture	2 6/9	2	6/9	2 6/9	2
Swainson's Hawk	Present	35	8/25	Present	2,400
Marsh Hawk	1 8/3	5	8/31	Present	75
Burrowing Owl	Present	50	8/31	Present	3,600
Reported by					

INSTRUCTIONS

(See Sec. 7532, Wildlife Refuge Field Manual)

Charles B. Darling, Refuge Manager

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1751

Form NR-1A

(Aug. 1952)

MIGRATORY BIRDS

(Other than Waterfowl)

Refuge Quivira Nat'l. W/L Refuge Months of September to December, 19 66

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Western Grebe	1	11/1	1	11/1	1	11/9				10
Eared Grebe		Present	10	9/30	2	10/5				300
Pied-billed Grebe		Present	75	11/16	75	11/16				500
White Pelican	72	9/9	4500	9/14	800	10/19				80000
Great Blue Heron		Present	55	9/9	10	11/4				2400
Sandhill Crane	35	10/7	4109	11/16	30	12/7				120000
Green Heron		Present	66	9/2	66	9/2				1800
Little Blue Heron		Present	20	10/4	20	10/4				600
Common Egret	1	10/28	2	11/4	2	11/4				20
B-C Night Heron		Present	51	9/2	20	9/9				1500
American Bittern		Present	10	9/1	2	10/15				750
Cormorant	10	9/16	10	9/16	8	10/4				300
II. Shorebirds, Gulls and Terns:										
Killdeer		Present	350	10/4	2	11/16				18000
L. Sandpiper		Present	1750	9/9	25	10/28				60000
Baird's Sandpiper		Present	1550	9/9	125	11/4				45000
White-rumped Sandpiper		Present	25	10/28	2	11/1				1500
Dowitcher		Present	42	10/4	1	11/16				2000
Greater Yellowlegs		Present	550	9/2	15	11/16				18000
Lesser Yellowlegs		Present	275	9/2	2	10/19				9000
Black Tern		Present	510	9/2	35	9/9				10000
Common Tern		Present	10	9/21	1	10/1				250
Least Tern	50	9/30	50	9/30	50	9/30				1500
Wilson's Phalarope	3	9/9	22	10/7	5	10/20				400
Avocet	22	10/7	22	10/7	14	10/19				200
Franklin's Gull	10	9/16	3000	10/14	500	10/28				50000
Ring-billed Gull	23	9/23	350	12/7	25	12/22				6400
Herring Gull	20	12/15	20	12/15	5	12/22				400
Sora	1	9/18	1	9/18	(over)	9/18				5

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Present	3000	9/1	10	11/1
White-winged dove					100000
IV. Predaceous Birds:					
Golden eagle	1	10/19	6	12/22	Present
Duck hawk					300
Horned owl	Resident	10		Present	1200
Magpie					
Raven					
Crow	Resident	50		Present	6000
Bald Eagle	6	11/16	9	12/22	Present
Swainson's Hawk	Present	75	10/3	15	10/5
Marsh Hawk	Present	125	11/4	Present	11250
Rough-legged Hawk	1	11/7	5	12/7	Present
Ferruginous Hawk	1	11/4	3	12/15	Present
Prairie Falcon	1	11/16	9	12/15	Present
Sparrow Hawk	1	9/10	75	9/30	Present
Red-tailed Hawk	1	9/7	10	12/15	Present
Sharp-shinned Hawk	5	9/30	5	9/30	Present
Burrowing Owl	Present	50		Present	300

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1750b

Form NR-1B

(Rev. Nov. 1957)

UNITED STATES

DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITATRefuge Quivira NWR, Stafford, Ks. For 12-month period ending August 31, 1966

Reported by

Title

Refuge Manager

Charles R. Darling

(1)	(2)	(3)	(4)	(5)
Area or Unit	Habitat		Breeding	
Designation	Type Acreage	Use-days	Population	Production
A	Crops	260 Ducks 6,164,879	100	130
	Upland	1220 Geese 1,163,568		
	Marsh	440 Swans		
	Water	640 Coots 38,146		
	Total	2560 Total 7,366,593	100	130
B	Crops	23 Ducks 159,608	30	50
	Upland	822 Geese 5,418		
	Marsh	90 Swans		
	Water	25 Coots		
	Total	960 Total 165,026	30	50
C	Crops	850 Ducks 388,622		
	Upland	3810 Geese 72,919		
	Marsh	80 Swans		
	Water	60 Coots 3,659		
	Total	4800 Total 465,200		
D	Crops	700 Ducks 168		
	Upland	1840 Geese		
	Marsh	20 Swans		
	Water	Coots		
	Total	2560 Total 168		
E	Crops	470 Ducks 26,348		
	Upland	3620 Geese		
	Marsh	80 Swans		
	Water	50 Coots		
	Total	4160 Total 26,348		
F	Crops	Ducks 929,294	70	90
	Upland	700 Geese 16,387		
	Marsh	3940 Swans		
	Water	720 Coots 59,437		
	Total	5360 Total 1,005,118	70	90
G	Crops	160 Ducks 2,128		
	Upland	1380 Geese		
	Marsh	40 Swans		
	Water	20 Coots		
	Total	1600 Total 2,128		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Quivira NWR

Months of January to April, 19 66

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specificioally requested. List introductions here.
Ring-necked Pheasant	Marshes, brush, shelterbelts, fence rows, wild plum thickets, willow thickets, tall- grass prairie lands	7.8			50-50				2,700	Loss of breeding population due to winter weather con- ditions was extremely light. Spring-time populations are high and birds seem healthy.
Bobwhite		6.0			50-50				4,000	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Quivira NWR, Stafford, Kansas

Months of May to August, 1966

(1) Species	(2) Density	(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
		Acres	Number broods obs'd.		Hunting	For Re-stocking	For Research		
Common Name	Cover types, total acreage of habitat	per Bird	Estimated Total	Percentage				Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Marshes, brush, shelterbelts, fence rows, wild plum thickets, willow thickets, tall prairie grasses	6.9	18	1400	50-50			3,200	
Bobwhite	" " " "	4.2	30	2000	50-50			4,750	

* Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | (1) SPECIES: | Use correct common name. | (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. | (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. | (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. | (5) REMOVALS: | Indicate total number in each category removed during the report period. | (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. | (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. |
|--------------|--------------------------|--------------|--|---------------------|---|----------------|---|---------------|--|------------|--|--------------|---|
| | | | | | | | | | | | | | |

* Only columns applicable to the period covered should be used.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge Quivira Nat'l. W/L Refuge

Months of September to December, 19 66

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals	(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'd. Estimated Total		Percentage	Hunting For Re- stocking For Research	Estimated number using Refuge	Pertinent infor- mation not specific- ally requested. List introductions here.
Ring-necked Pheasant	Marshes, brush, shelterbelts, fence row, wild plum thickets, willow thickets, tall prairie grasses	7.3			50-50	0 0 0	3,000	Winter loss to end of year has been light.
Bobwhite		4.9			50-50	0 0 0	4,250	

* Only columns applicable to the period covered should be used.

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

- | (1) SPECIES: | Use correct common name. |
|---------------------|--|
| (2) DENSITY: | Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. |
| (3) YOUNG PRODUCED: | Estimated number of young produced, based upon observations and actual counts in representative breeding habitat. |
| (4) SEX RATIO: | This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available. |
| (5) REMOVALS: | Indicate total number in each category removed during the report period. |
| (6) TOTAL: | Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons. |
| (7) REMARKS: | Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested. |

* Only columns applicable to the period covered should be used.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Quivira Nat'l. W/L Refuge

Calendar Year 1966

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
Common Name	Cover types, total Acreage of Habitat	Number												
White-tailed Deer	Shelterbelts, tall prairie grasses, timberclaims and salt cedar thickets	25	0	0	0	0				0		75	75	1:1

Remarks:

Reported by _____

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

116000

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Quivira Nat'l. W/L Refuge

Year ending April 30, 1966

(1) Species	(2) Density	(3) Removals	(4) Disposition of Furs							(5) Total				
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Popula- tion
								Permit Number	Trappers Share	Refuge share				
Opossum	Upland woods & range 15,000 acres	100												150
Raccoon	22,000 acres	175												125
Mink	Streams & marshes 10,000 acres	500												20
Skunk	22,000 acres	100												220
Badger	Upland sand hills 6,000 acres	200												30
Coyote	22,000 acres	440												50
Blacktail	100 acres	.8												125
Prairie dog														
Fox Squirrel	Shelter belts, 100 a.	1												100
Beaver	Rattlesnake Creek	4.5												10
Blacktail	Upland range and													
Jackrabbit	shelterbelts, 18000 a.	200												75
Cottontail	-do-	4												4500
Muskrat	Ponds, 500 a.	50												10
Weasel	Streams and marshes 10,000 acres	750												13

List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Populations of small mammals is virtually unchanged from last year.

Reported by _____

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- | (2) | (1) | (2) | (3) | (4) | (5) |
|-----|----------------------------|--|-----|-----|-----|
| | SPECIES: | Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.) | | | |
| | DENSITY: | Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks. | | | |
| | REMOVALS: | Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed. | | | |
| | DISPOSITION OF FUR: | On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprimeness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided. | | | |
| | TOTAL POPULATION: | Estimated total population of each species reported on as of April 30. | | | |
| | REMARKS: | Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested. | | | |

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge Quivira Nat'l. W/L Refuge, Stafford, KansasCalendar Year 1966

1. Visits

a. Hunting None b. Fishing None c. Miscellaneous 1629 d. TOTAL VISITS 1629

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	None		
Upland Game	None		
Big Game	None		
Other	None		

Number of permanent blinds NoneMan-days of bow hunting included above None

Estimated man-days of hunting on lands adjacent to

refuge 1000

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	None	
Streams and Shores	None	

1c. Miscellaneous Visits

Recreation 1429 Official 75
 Economic Use 100 Industrial 25

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	On Refuge		Off Refuge	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs	2	310	1	35
Bird and Garden Clubs	2	25	1	32
Schools	3	67	4	193
Service Clubs			4	140
Youth Groups				
Professional-Scientific	1	28		
Religious Groups	1	15	4	143
State or Federal Govt.				
Other <u>Saddle Club</u>	1	69		

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	18	Radio Presentations	
Newspapers (P.R.'s sent to)	4	Exhibits	
TV Presentations		Est. Exhibit Viewers	

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercoastal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and week-end samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Quivira Nat'l. W/L Refuge Year 1946

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
Sand Lovegrass Weeping Lovegrass Blackwell Switch	Units 6, 9, 17, 19, 27, 39, 55, 64	3#/Acre.	65 acres	32.5# weeping lovegrass 65# sand lovegrass 97.5# switchgrass	March April May	Poor	Dry weather	Seeded to establish grass stands in grazing units and stabilize sand dunes.
Sand Lovegrass Weeping Lovegrass Blackwell Switch Alfalfa	Units 19, 33, 37, 39, 59	3#/Ac.	70 acres	30# alfalfa 30# weeping love 60# sand love 90# switch	Nov.	Unknown		To prevent erosion on newly constructed dikes and ditches.

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches.....
Forest plantings.....

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Quivira Nat'l. W/L Refuge County Stafford State Kansas

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Winter Wheat	285	2400 bu.	95	800 bu.			380 a.	610 acres of wheat and 58 acres of rye available for green browse. 90 a. to be turned under for green manure. (all planted in fall of 1966)	
Winter Wheat(gov't)			120	500 bu.			120 a.		
Milo	191.3	5730 bu.			95.7	2865 bu.	287 a.		
Milo (gov't)			34	900 bu.	126	3150 bu.	160 a.		
Rye (gov't)			8	60 bu.			8 a.		
								Fallow Ag. Land	393 a.

No. of Permittees: Agricultural Operations 5 Haying Operations 10 Grazing Operations 14

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
Alfalfa	33.7	55	\$101.30	1. Cattle	541	2705	\$6086.25	4600
				2. Other				
				1. Total Refuge Acreage Under Cultivation				1697
Hay - Wild	498.6	490	747.91	2. Acreage Cultivated as Service Operation				523

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Quivira Nat'l. W/L Refuge County Rice State Kansas

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Milo	35.3	870 bu.			17.7	435 bu.	53 a.	80 acres of winter wheat planted in the fall of 1966 available for green browse.	
								Fallow Ag. Land	80 a.

No. of Permittees: Agricultural Operations 3 Haying Operations 0 Grazing Operations 2

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
None				1. Cattle	65	325	\$731.25	410
				2. Other				
				1. Total Refuge Acreage Under Cultivation				240 a.
Hay - Wild	None			2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

Refuge Quivira Nat'l. W/L Refuge

Months of January through December, 1966

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Wheat	300 bu.	1300 bu.	1600 bu.	755 bu.	400 bu.	220 bu.	1375	225 bu.		225 bu.	none
Rye	0	60 bu.	60 bu.		60 bu.		60	0			
Milo	0	900 bu.	900 bu.	210 bu.		40 bu.	250	650 bu.		650 bu.	none

(8) Indicate shipping or collection points _____

(9) Grain is stored at Refuge Sub-headquarters grain bins.

(10) Remarks _____

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

3-1979 (NR-12)
(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

Quivira Nat'l. W/L Refuge

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

1-66

Reporting Year

1966

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
April - June	Russian Olive, Fremont Cottonwood, Tamarisk	Small clusters and individual trees throughout the refuge.	120	2,4-D butyl ester	10.5 gal.	.50 A.E./A. estimated	1 gal./A. estimated	Power and hand spray units.

10. Summary of results (continue on reverse side, if necessary)

Apparently good although next year's growth will probably show some regrowth and further treatment will be necessary. Some Russian Olives hand cut in the spring and the stumps treated showed some sucker regrowth.

CHRISTMAS BIRD COUNT

By Charles R. Darling, Refuge Manager
Michael B. Brownlee, Asst. Ref. Mgr.
Wayne E. Dale, Refuge Clerk

Quivira National Wildlife Refuge, Stafford, Kansas, 38°09' N, 98°29' W. (All points within a 15-mile diameter circle, center Refuge Sub-headquarters). The Quivira count area lies in NE Stafford, NW Reno and SW Rice Counties, Kansas. Principal terrain features are Rattlesnake Creek, Little Salt Marsh and Big Salt Marsh. The creek enters the count area in the SW quarter of the circle, flows easterly into the Little Salt Marsh, thence northerly along the eastern side of the Big Salt Marsh. After leaving the Big Salt Marsh area, it flows easterly into the Arkansas River. The central part of the count area is rather flat and either of marsh type or with a very high water table. The east and west sides of the area are characterized by low sandhills and dunes, interspersed with ponds during wet seasons. Vegetative types are: Native tall grasses, marsh grasses, cottonwood and willow groves and scattered wheat and milo fields.

December 22, 1966; 7:00 a.m. to 5:00 p.m.; temp. 24° to 28°; wind N. 20 mph; heavy overcast w/snow flurries. Total party-hours 12; Total party miles 73.5, 1.5 on foot, 72 by vehicle.

Canada Goose	3,720	Herring Gull	5
Snow Goose	1	Ring-billed Gull	11
Blue Goose	1	Great Horned Owl	1
Mallard	74,212	Yellow-shafted Flicker	14
Pintail	450	Red-shafted Flicker	5
Green-winged Teal	2	Downy Woodpecker	1
Shoveler	1	Blue Jay	1
Common Goldeneye	10	Common Crow	37
Bufflehead	32	Black-capped Chickadee	1
Common Merganser	200	Loggerhead Shrike	1
Red-tailed Hawk	4	Starling	2
Rough-legged Hawk	1	Eastern Meadowlark	70
Ferruginous Hawk	1	Red-winged Blackbird	802
Golden Eagle	6	Cardinal	2
Bald Eagle	8	Vesper Sparrow	26
Marsh Hawk	38	Slate-colored Junco	2
Prairie Falcon	1	Tree Sparrow	137
Bobwhite	56	Harris' Sparrow	45
Ring-necked Pheasant	8	Song Sparrow	2

38 Species

79,917 Individuals



DON'T SHOOT IT! Even at this distance an experienced hunter will recognize an immature golden eagle, not just another hawk. Eagles are protected by extremely stiff penalties and as a result, their numbers are increasing — if slowly — around their winter homes in Kansas. This shot was made with a telescopic lens at the Quivira National Wildlife Refuge between St. John and Hutchinson where the eagle population now stands at 50 balds and fewer golden eagles. The eagles will head back for their summer homes in the Rockies in March.

Quivira: Winter Home Of America's Eagles

By JAMES BARR FUGATE
Tribune Area Editor

HUDSON — Between Hutchinson and St. John in the great salt marshes south of the Arkansas River, lies one of the favorite winter homes of the magnificent symbol of the United States — the American Bald Eagle.

Here, in the Quivira National Wildlife Refuge, in an unbroken stretch of more than 20,000 acres of grass and waterfields, about 50 bald eagles and considerably fewer golden eagles — the only two eagles native to this country — arrive late in November and stay until March.

Where they come from, no one can say for certain. The best guesses put them in the east slope of the Rocky Mountains from Colorado all the way up to Canada.

Here in Kansas, the big birds build no nests, nor hatch any young. That is done in their huge, ponderous nests in their summer homes. During the winter months, like wealthy city-dwellers, the eagle heads south to escape the rigorous cold weather, and it is a meas-

ure of the eagle's toughness that it considers a Kansas winter as moderate enough for comfort.

Protected By Law

Protected against hunters by severe penalties, the American Bald Eagle — which isn't bald at all, by the way — is increasing slowly in numbers, says Quivira Refuge Manager Jim Harmon. In 1958, two years after the refuge really got rolling, there were less than 20 birds. Now there are over 50. And in the years ahead, there are hopes for many more.

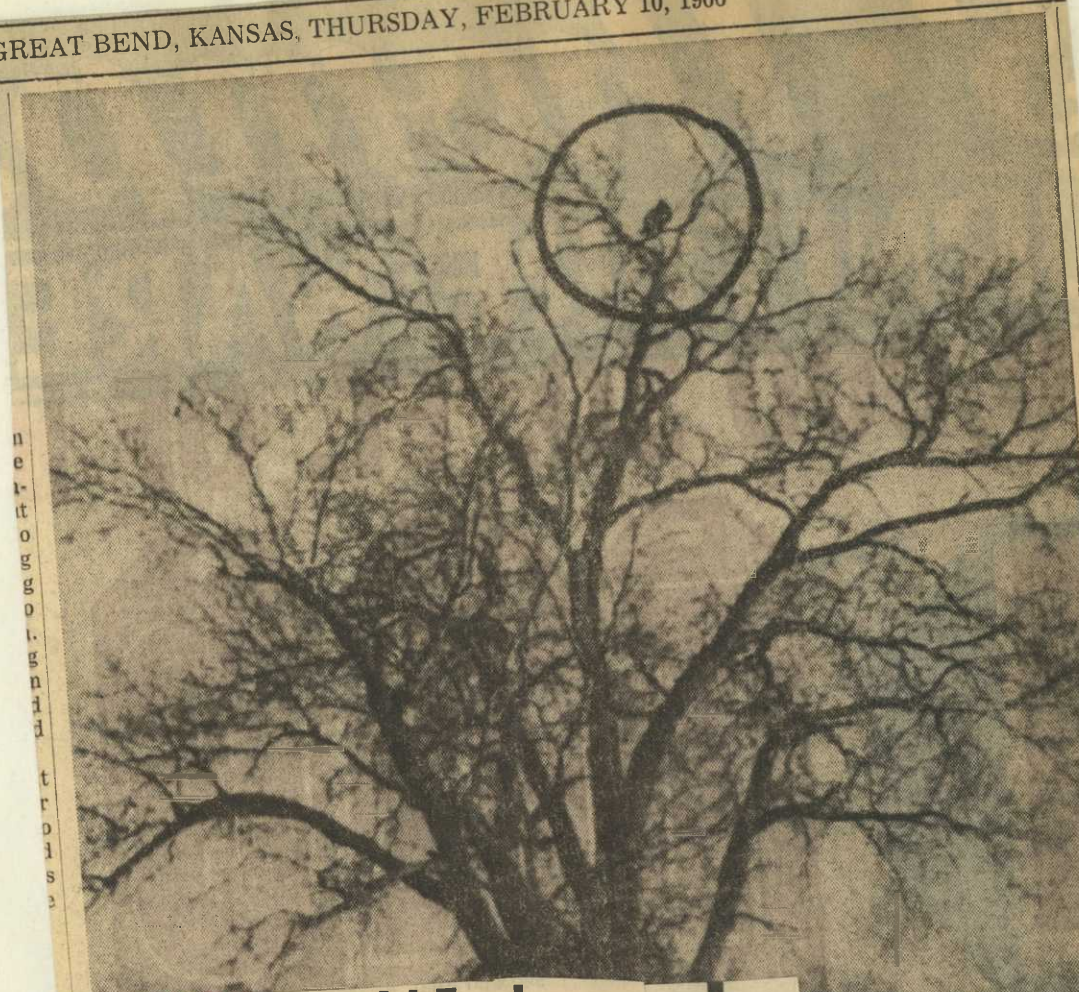
Surprisingly little is known about the eagle, Harmon says, as he chats with visitors to the refuge, who are always welcome.

A lot of myths and misconceptions have grown up around eagles that cause people to regard them with more awe than they deserve.

Clumsy Hunters

In the first place, the eagle is a lousy hunter, taking his prey in a long, sweeping slide

(See BALD EAGLE on Page 3)



Bald Eagle

(Continued from Page one)

that's about as easy to spot from the ground as a horse in a skating rink. Rabbits and pheasants can easily get away if there's any coverage at all—even ducks just have to make a convenient dive and the eagle is still hunting his dinner. He seems to be a more successful fisherman than hunter for some odd reason.

But things being as they are, the eagle's favorite food is a bit of gamey game — or, let's face it, carrion — for he's a notorious scavenger.

As for flying off occasionally with a farmer's calf or sheep—forget it, Charlie!

"It's all an eagle can do to get airborne with a two-pound cock pheasant," says Harmon. "In spite of his wing-tip spread of five or six feet, he weighs only about 10 or 12 pounds, 15 at the most."

20 Mile Range

The eagle's normal range for hunting is about twenty miles from his favorite hunting tree. He always hunts alone and he will have another favorite tree for loafing. But come nightfall, he'll return to the refuge to put up in the company of his family and friends in a cottonwood grove.

An odd characteristic of the eagle is that he feeds his young until they are fully grown. When the young eagle leaves the nest for the first time, it weighs more than at any other time in its life. And it has to be taught to hunt and kill by its parents.

Being naturally as lazy as sin, the eagle often attacks hawks that have just made a kill, and when the hawk drops the prey, the eagle has been known to seize it before it can hit the ground.

They're also great kidders, and when they've finished dining on a carcass, they like to toss what's left of it around among themselves, rather like a bunch of boys with a football.

Kansans are proud of their game refuges, and most of us are pleased that the eagles, (an estimated 200 in the state), have chosen our refuges to winter in. It behooves all of us to learn enough about them to distinguish them from hawks and do all we can to protect America's national emblem — the eagle.

inter will recognize an im-
protected by extremely
ing — if slowly — around
telescopic lens at the Qui-
inson where the eagle pop-
le eagles will head back

The Stafford Courier

3-31-66

E. A. BRILES Publisher
R. T. DARNALL Business Manager

SUBSCRIPTIONS: \$3.00 per year, in advance
Outside Kansas \$3.50 per year, in advance

Member Kansas Press Association 1966
Member National Editorial Association 1966
National Advertising Representative, Kansas
Press Service, Inc., Topeka, Kansas

HARMAN'S CONTRIBUTION

As Jim Harman leaves this community, we come to a fuller realization of what a fine contribution he has made to this community. During his time here he has virtually become "Mr. Quivira." The development of the refuge under his guidance will be a perpetual monument to his efforts.

Actually most of us have not become fully aware of what a fine resource this game preserve is. As time goes on we will more fully realize what it means. During his years here Mr. Harman has steadily and quietly worked at making Quivira from a dream into a reality. He has had the vision but has relied on results rather than promises to get others to also see it.

He has the ability to sell the possibilities to the higher echelon in the wild life service, and get the funds required to carry on the project. It isn't altogether complete as yet but is so well advanced that it will eventually reach the goal he has had in mind. He has used funds wisely to get the most out of the money he has had to work with.

Actually Mr. Harman has been telling us in

his quiet manner all the time that Quivira can be one of the outstanding waterfowl sanctuaries in the entire country. His affection for wild life is deep seated and he probably never fails to get a thrill every time he looks at the flocks of thousands of geese and ducks that come there. His pleasure in showing them to others is sincere.

We hate to see him go and he has not been anxious to leave. Some way it seems that Jim Harman should always be at Quivira because no one else could be as devoted to its progress and success. Not only that but he and his family have done much toward the betterment of the community generally.

We wish the Harmans all the luck in the world wherever they go. As Quivira becomes more important in our activities, draws more and more visitors from the outside, our gratitude to the Harmans will increase. Their contributions to the community cannot be fully measured.

—o—
FALSE ALARMS



Quivira Mgr. Hands Over Ck. For \$16,315.05

Now you know precisely how a person looks when he is handing over a check for \$16,315.05 and how a County Treasurer looks when she is receiving that check. Also you know how a County Superintendent reacts as she watches the procedure.

The above is a picture of Chas. R. Darling, manager of Quivira Wildlife Refuge, handing to Florence DeSelms, County Treasurer, a government check in the amount of \$16,315.05. County Superintendent Kate Carter, looks on in obvious approval.

The check represents this year's payment from Quivira to the county, and it is computed on the basis of adjusted land values in the refuge—three fourths of one per cent of the value of the lands acquired specifically for refuge purposes.

County Treasurer Florence DeSelms had no idea of the amount of the payment until Mr. Darling calmly held the check for her to see.

You can imagine her surprise, remembering that last year the check was for \$2073.00, about one-eighth of this year's payment.

Reason for the whopping increase is explained by Mr. Darling: "Last year, the payment represented one fourth of the year's income at Quivira—sale of feed, rental—all income. This year an entirely different basis was used for computing the income—the percentage of value basis," explained Mr. Darling.

Quivira, in Stafford county, includes 18,971.1 acres and its ad-

QUIVIRA EMPLOYEE GETS TEN YEAR SERVICE AWARD

Darrell K. Keesling was presented the Department of Interior ten year service emblem by Refuge Manager Darling on Dec. 2. A congratulatory letter from William T. Krummes, Acting Regional Director of Region 2, Bureau of Sport Fisheries and Wildlife, accompanied the emblem.

Keesling completed ten years of federal service Nov. 23, 1966. He began his employment at the Quivira National Wildlife Refuge on June 2, 1960 as tractor operator. Since August 20, 1961 he has been employed as Maintenance man at the Refuge. Prior federal service included approximately nine months with the U. S. Forestry Service and three years with the Navy in 1942 - 1945.

Quivira Head To New Mexico Post

ALBUQUERQUE —Regional Director John C. Gatlin announced today the appointment of Mr. Joshua J. Harman as Assistant Regional Supervisor of Refuges for the Southwest Region of the Bureau of Sport Fisheries and Wildlife.

A native of Oklahoma, the 41-year old Harman will help supervise operations of the Bureau's system of wildlife refuges in the eight southwestern states. He replaced Don Redfearn, who was transferred to the National Elk Refuge, Jackson, Wyoming.

Mr. Harman began his career with the Department of the Interior wildlife agency in 1950, at the Wichita Mountains Wildlife Refuge in Oklahoma, after a short term of employment with the Oklahoma Department of Wildlife Conservation. A 1949 graduate of Oklahoma State University, he has held positions of increasing responsibility on four other national wildlife refuges in Texas, New Mexico, and Kansas, and comes to the Albuquerque position from Quivira National Wildlife Refuge in Kansas.

An Air Force veteran, Mr. Harman and his family will make their home in Albuquerque.